This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a **Minor, Municipal** permit. The discharge results from the operation of a 0.345 MGD wastewater treatment plant. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq.

1.	Facility Name and Mailing Address:	Thornburg Wastewater Treatment Facility 10900 HCC Drive Fredericksburg, VA 22408	SIC Code:	4952 WWTP
	Facility Location:	5225 Mud Tavern Road Woodford, VA 22580	County:	Spotsylvania
	Facility Contact Name:	Doug Crooks, Superintendent WWTF	Telephone Number:	540-507-7362
2.	Permit Number:	VA0029513	Expiration Date of Previous Permit:	January 11, 2010
	Other VPDES Permits:	None		
	Other Permits:	None		
	E2/E3/E4 Status:	N/A		
3.	Owner Name:	Spotsylvania County		
	Owner Contact/Title:	Ed Petrovitch, Director of Public Utilities	Telephone Number:	540-507-7300
4.	Application Complete Date:	July 15, 2009		
	Permit Drafted By:	Anna Westernik	Date Drafted:	November 6, 2009
	Draft Permit Reviewed By:	Alison Thompson	Date Reviewed:	November 20, 2009
	Public Comment Period:	Start Date: December 22, 2009	End Date:	January 20, 2010
5.	Receiving Waters Information:	See **Attachment 1** for the Flow Frequency Determination		
	Receiving Stream Name:	Po River, UT		
	Drainage Area at Outfall:	0.19 square miles	River Mile:	1.13
	Stream Basin:	York River	Subbasin:	None
	Section:	3	Stream Class:	III
	Special Standards:	None	Waterbody ID:	VAN-F16R
	7Q10 Low Flow:	0.00 MGD	7Q10 High Flow:	0.00 MGD
	1Q10 Low Flow:	0.00 MGD	1Q10 High Flow:	0.00 MGD
	30Q10 Flow:	0.00 MGD	30Q10 High Flow:	0.00 MGD
	Harmonic Mean Flow:	0.00 MGD	30Q5 Flow:	0.00 MGD
	303(d) Listed:	Downstream Segments (See Section 26)		
	TMDL Approved:	No	Date TMDL Approved:	N/A

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

✓	State Water Control Law		EPA Guidelines
✓	Clean Water Act	✓	Water Quality Standards
✓	VPDES Permit Regulation		
✓	EPA NPDES Regulation		

7. Licensed Operator Requirements: Class II

8. Reliability Class: Class I

Revised 2/2003

State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Thornburg WWTF
NPDES Permit Number:	VA00029513
Permit Writer Name:	Anna Westernik
Date:	October 27, 2009

Major [ ] **Minor** [X] **Industrial** [ ] **Municipal** [x]

I.A. Draft Permit Package Submittal Includes:

	Yes	No	N/A
1. Permit Application?	x		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	x		
3. Copy of Public Notice?	x		
4. Complete Fact Sheet?	x		
5. A Priority Pollutant Screening to determine parameters of concern?	x		
6. A Reasonable Potential analysis showing calculated WQBELs?	x		
7. Dissolved Oxygen calculations?	x		
8. Whole Effluent Toxicity Test summary and analysis?		x	
9. Permit Rating Sheet for new or modified industrial facilities?		x	

I.B. Permit/Facility Characteristics

	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		x	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	x		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	x		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		x	
5. Has there been any change in streamflow characteristics since the last permit was developed?		x	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		x	
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	x		
8. Does the facility discharge to a 303(d) listed water?	x		
a. Has a TMDL been developed and approved by EPA for the impaired water?		x	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?		x	
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	x		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		x	
10. Does the permit authorize discharges of storm water?		x	

Attachment 12

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		x	
12. Are there any production-based, technology-based effluent limits in the permit?		x	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		x	
14. Are any WQBELs based on an interpretation of narrative criteria?		x	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		x	
16. Does the permit contain a compliance schedule for any limit or condition?	x		
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		x	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	x		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		x	
20. Have previous permit, application, and fact sheet been examined?	x		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs*

(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	**Yes**	**No**	**N/A**
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	x		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	x		

II.B. Effluent Limits – General Elements	**Yes**	**No**	**N/A**
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	x		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	x		

II.C. Technology-Based Effluent Limits (POTWs)	**Yes**	**No**	**N/A**
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	x		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	x		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			x
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	x		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	x		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		x	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			x

II.D. Water Quality-Based Effluent Limits	**Yes**	**No**	**N/A**
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	x		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?		x	
3. Does the fact sheet provide effluent characteristics for each outfall?	x		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	x		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	x		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	x		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	x		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?		x	
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	x		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	x		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	x		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	x		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	x		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	x		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	x		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		x	
4. Does the permit require testing for Whole Effluent Toxicity?		x	

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	x		
2. Does the permit include appropriate storm water program requirements?			x

II.F. Special Conditions – cont.	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			x
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			x
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		x	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		x	
a. Does the permit require implementation of the "Nine Minimum Controls"?			x
b. Does the permit require development and implementation of a "Long Term Control Plan"?			x
c. Does the permit require monitoring and reporting for CSO events?			x
7. Does the permit include appropriate Pretreatment Program requirements?			x

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	x		

List of Standard Conditions – 40 CFR 122.41

Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
Duty to mitigate	Monitoring and records	Transfers
Proper O & M	Signatory requirement	Monitoring reports
Permit actions	Bypass	Compliance schedules
	Upset	24-Hour reporting
		Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?			

* Facility is a PVOTW and a municipal.

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Review Checklist – For Non-Municipals

(To be completed and included in the record for all non-POTWs)

II.A. Permit Cover Page/Administration	**Yes**	**No**	**N/A**
1. Does the fact sheet **or** permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?			
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?			

II.B. Effluent Limits – General Elements	**Yes**	**No**	**N/A**
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?			
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?			

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ)	**Yes**	**No**	**N/A**
1. Is the facility subject to a national effluent limitations guideline (ELG)?			
a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?			
b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?			
2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?			
3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?			
4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a "reasonable measure of ACTUAL production" for the facility (not design)?			
5. Does the permit contain "tiered" limits that reflect projected increases in production or flow?			
a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?			
6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?			
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits?			
8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?			

II.D. Water Quality-Based Effluent Limits	**Yes**	**No**	**N/A**
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?			
2. Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL?			
3. Does the fact sheet provide effluent characteristics for each outfall?			
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?			
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?			
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?			

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?			
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations where data are available)?			
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?			
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?			
6. For all final WQBELs, are BOTH long-term (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established?			
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?			
8. Does the fact sheet indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?			

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters?			
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?			
3. Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices?			

II.F. Special Conditions	Yes	No	N/A
1. Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs?			
a. If yes, does the permit adequately incorporate and require compliance with the BMPs?			
2. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			
3. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?			

List of Standard Conditions – 40 CFR 122.41

Duty to comply
Duty to reapply
Need to halt or reduce activity not a defense
Duty to mitigate
Proper O & M
Permit actions
Property rights
Duty to provide information
Inspections and entry
Monitoring and records
Signatory requirement
Bypass
Upset
Reporting Requirements
Planned change
Anticipated noncompliance
Transfers
Monitoring reports
Compliance schedules
24-Hour reporting
Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for existing non-municipal dischargers regarding pollutant notification levels [40 CFR 122.42(a)]?			

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Anna Westernik
Title	Environmental Specialist II
Signature	A Westernik
Date	October 27, 2009

9. Permit Characterization:

___ Private	___ Effluent Limited	___ Possible Interstate Effect
___ Federal	✓ Water Quality Limited	___ Compliance Schedule Required
___ State	___ Toxics Monitoring Program Required	___ Interim Limits in Permit
✓ POTW	✓ Pretreatment Program Required	___ Interim Limits in Other Document
___ TMDL		

10. Wastewater Sources and Treatment Description:

Wastewater treatment for this 0.345 MGD plant consists of a manual bar screen and aerated grit chamber, two aerated lagoons (one is operational during the warmer months and two are operational during the colder months), secondary clarifiers, sand filtration, chlorination, dechlorination and post aeration.

On December 9, 2003, the automatic lime feed system was placed online. A portion of the filter backwash water is pumped to a vat where it continuously mixed with lime. This solution is delivered to the head of the plant through the filter backwash line at a continuous rate. The permittee states that this treatment unit will maintain average and minimum hardness values in the effluent of 175 mg/l and 150 mg/l, respectively.

Two chlorine contact tanks operate in series. 12.5% sodium hydroxide is added prior to the chlorine contact tanks. The effluent is metered after dechlorination with sodium bisulfite and post-aeration.

See **Attachment 2** for a facility schematic/diagram.

TABLE 1
OUTFALL DESCRIPTION

Outfall Number	Discharge Sources	Treatment	Design Flow	Outfall Latitude and Longitude
001	Municipal Wastewater	See Item 10 above.	0.345 MGD	38° 08'09"/77°30'58"
See **Attachment 3** for Spotsylvania quadrangle (170A)				

11. Sludge Treatment and Disposal Methods:

The waste sludge tank is pumped daily to a sludge holding tank. Every two weeks the waste sludge is hauled from this tank to the FMC sewage treatment plant for treatment.

12. Discharges in Waterbody VAN-F16R

TABLE 2
DISCHARGES, INTAKES & MONITORING STATION LOCATIONS

Permit Number	Description	Latitude / Longitude
VA0061298	John J. Wright Middle School STP	38° 09'19"/77°25'43"
VA0029513	Thornburg Community STP	38° 08'08"/77°30'05"
VA0029769	Indian Acres STP	38° 08'45"/77°32'30"

13. Material Storage:

TABLE 3 MATERIAL STORAGE		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Lime	18,000 lbs. maximum	In storage shed on pallets
Sodium Hydroxide, 12.5%	120 gallons maximum	Stored in chemical feed room in 15-gallon drums
Sodium Bisulfite, 38%	120 gallons maximum	Stored in chemical feed room in 15-gallon drums
Calcium Chloride	50 lbs. maximum	Stored in shed on pallets
Gasoline	5 gallons maximum	Stored in shed in OSHA approved can
Muriatic Acid	4 gallons maximum	Stored in sand filter room

14. Site Inspection: Performed by Anna Westernik on July16, 2009 (see **Attachment 4**).

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

There is no monitoring data for the unnamed tributary to the Po River. This unnamed tributary of the Po River flows into the Po River, which in turn flows into the Poni River. The Poni River flows into the Mattaponi River. The nearest downstream monitoring station is DEQ ambient monitoring station 8-MPN094.79 at the Rt. 605 bridge crossing, located approximately 14.1 miles downstream from Outfall 001 in Waterbody VAN-F17R. The following information is the monitoring summary for 8-MPN094.79 and 8-MPN094.94 (at the old bridge upstream from Route 605) as taken from the 2008 Integrated Assessment:

E.coli monitoring finds a bacteria impairment, resulting in an impaired classification for the recreation use. Ambient monitoring finds a pH impairment, resulting in an impaired classification for the aquatic life use. The pH impairment may be due to natural conditions. The wildlife use is considered fully supporting. The fish consumption use was not assessed.

See **Attachment 5** – Planning Statement for the Thornburg Community STP.

b. Receiving Stream Water Quality Criteria

Part IX of 9 VAC 25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, an unnamed tributary of the Po River, is located within Section 3 of the York River Basin, and classified as Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature less than 32°C, and a pH of 6.0 – 9.0 standard units (S.U.).

Attachment 6 details other water quality criteria applicable to the receiving stream.

Staff has evaluated the effluent data for pH and temperature for the September 2008 through September 2009 period and finds no significant differences from the data used to establish ammonia criteria and subsequent effluent limits in the previous permit (**Attachment 7**). See **Attachment 6** for the acute and chronic ammonia water quality criteria calculations.

Bacteria Criteria:
The Virginia Water Quality Standards (9 VAC 25-260-170 B.) states sewage discharges shall be disinfected to achieve the following criteria:

E. coli bacteria per 100 mL of water shall not exceed the following:

	Geometric Mean[1]	Single Sample Maximum
Freshwater *E. coli* (N/100 mL)	126	235

[1]For two or more samples [taken during any calendar month

c. Receiving Stream Special Standards
The State Water Control Board's Water Quality Standards, River Basin Section Tables (9 VAC 25-260-360, 370 and 380) designates the river basins, sections, classes and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, an unnamed tributary of the Po River, is located within Section 3 of the York River Basin. This section has not been designated with a special standard.

d. Threatened or Endangered Species
The Virginia DGIF Fish and Wildlife Information System Database was searched for records on October 15, 2009 to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened or endangered species were identified within a 2 mile radius of the discharge: Dwarf Wedgemusssel, Upland Sandpiper, Loggerhead Shrike, Bachman's Sparrow, Bald Eagle, and Loggerhead Migrant Shrike. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and therefore protect the threatened and endangered species found near the discharge.

The stream that the facility discharges to is within a reach identified as having a potential for Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

16. Antidegradation (9 VAC 25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 based on stream flow. There are extended periods during which the stream is comprised solely of the discharge from the Wastewater Treatment Plant. Permit limits proposed have been established by determining wasteload allocations that will result in attaining and/or maintaining all water quality criteria applicable to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLAs) are calculated. In this case, since the critical flows 7Q10 and 1Q10 have been determined to be zero, the WLAs are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. In the case of ammonia evaluations, limits are needed if the 97th percentile of the thirty-day average effluent concentration values is greater than the chronic WLA. Effluent limitations are based on the most limiting WLA, the required sampling frequency and statistical characteristics of the effluent data.

a. Mixing Zones and Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- Q_s = Critical receiving stream flow
  = (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; 30Q10 for ammonia criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- C_s = Mean background concentration of parameter in the receiving stream

The water segment receiving the discharge via Outfall 001 is considered to have a 7Q10 and 1Q10 of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the C_o.

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Outfall 001 discharge, ammonia as N is likely present since this is a WWTP treating sewage and total residual chlorine may be present since chlorine is used for disinfection. **Attachment 6** details the mixing analysis results and WLA derivations for these pollutants.

b. Effluent Limitations, Outfall 001 – Toxic Pollutants

9 VAC 25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9 VAC 25-31-230.D. requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N:

Staff evaluated ammonia criteria using effluent pH and temperature data from September 2008 through September 2009. Since the pH and temperature data is not significantly different than what was used to derive the current criteria and recalculated limits were found to be greater than the current limits. (**Attachment 8**). Therefore, existing ammonia limitations are proposed to continue in the reissued permit.

2) Total Residual Chlorine:

Chlorine is used for disinfection and is potentially in the discharge. Staff calculated WLAs for TRC using current critical flows and the mixing allowance. In accordance with current DEQ guidance, staff used a default data point of 0.2 mg/L and the calculated WLAs to derive limits. A monthly average of 0.008 mg/L and a weekly average limit of 0.010 mg/L are proposed for this discharge (see **Attachment 9**).

c. Effluent Limitations and Monitoring, Outfall 001 – Conventional Pollutants

No changes to dissolved oxygen (D.O.), biochemical oxygen demand-5 day (BOD_5), total suspended solids (TSS), and pH limitations are proposed.

Dissolved Oxygen and BOD_5, limitations are based on the stream modeling conducted in August 1986 (**Attachment 10**) and are set to meet the water quality criteria for D.O. in the receiving stream. Based on this modeling, the Thornburg Community STP was given a BOD_5 limit of 20 mg/L and a D.O. limit of 7.0 mg/L at a design flow of 0.345 MGD. The model incorporates the flow from two upstream dischargers (JJ Wright STP and Indian Acres STP). The Wishner STP, downstream from the Thornburg Community STP, is included in this model but is no longer in service. However, the model can still be considered valid since there have been no requests for increases in flow from the modeled dischargers and the Wishner STP was downstream of the Thornburg Community STP.

It is staff's practice to equate the Total Suspended Solids limits with the BOD_5 limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

d. Effluent Limitations and Monitoring Summary

The effluent limitations are presented in the following table. Limits were established for DO, BOD_5, TSS, Ammonia, pH, Total Residual Chlorine, and total hardness.

The limit for Total Suspended Solids is based on Best Professional Judgement.

The mass loading (kg/d), for monthly and weekly averages, were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9 VAC 25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD_5/$cBOD_5$ and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19. Effluent Limitations/Monitoring Requirements:

Design flow is 0.345 MGD.

Effective Dates: During the period beginning with the permit effective date and lasting until the permit expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	N/A	NL	N/A	N/A	NL	Continuous	TIRE
pH	1, 3	N/A	N/A	6.0 S.U.	9.0 S.U.	1/D	Grab
BOD_5	3,5	20 mg/L 26 kg/day	30 mg/L 39 kg/day	N/A	N/A	3D/W	8H-C
Total Suspended Solids (TSS)	2	20 mg/L 26 kg/day	30 mg/L 39 kg/day	N/A	N/A	3D/W	8H-C
DO	3, 5	N/A	N/A	7.0 mg/L	N/A	1/D	Grab
Ammonia, as N	3	2.3 mg/L	3.0 mg/L	N/A	N/A	3D/W	8H-C
Total Residual Chlorine (after contact tank)	4	N/A	N/A	1.0 mg/L	N/A	3/D	Grab
Total Residual Chlorine (after dechlorination)	3	0.0080 mg/L	0.0010 mg/L	N/A	N/A	3/D	Grab
Total Hardness (mg/L)	2	NL	N/A	NL	N/A	3D/W	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model – **Attachment 10**

MGD = Million gallons per day.
N/A = Not applicable.
NL = No limit; monitor and report.
TIRE = Totalizing, indicating and recording equipment.
S.U. = Standard units.

1/D = Once every day.
3/D = Three times every day at 4-hour intervals.
3D/W = Three days a week.

8H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 8-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of eight (8) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum eight (8) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

20. Other Permit Requirements:

a. Part I.B. of the permit contains additional chlorine monitoring requirements, quantification levels and compliance reporting instructions.
Minimum chlorine residual must be maintained at the exit of the chlorine contact tank to assure adequate disinfection. No more that 3 of the monthly test results for TRC at the exit of the chlorine contact tank shall be < 1.0 mg/L with any TRC < 0.6 mg/L considered a system failure.

9 VAC 25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9 VAC 25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

b. Permit Section Part I.C., details the requirements of a Pretreatment Program.
The VPDES Permit Regulation at 9 VAC 25-31-210 requires monitoring and 9 VAC 25-31-220.D. requires all dischargers protect water quality. The VPDES Permit Regulation at 9 VAC 25-31-730. through 900., and 40 CFR Part 403 requires POTWs with a design flow of > 5 MGD and receiving from Industrial Users (IUs) pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards to develop a pretreatment program.

Spotsylvania County is required to implement an approved pretreatment program in accordance with the Pretreatment Regulation at 9 VAC 25-31-800. Spotsylvania County operates several wastewater treatment plants with a combined flow of greater than 5 MGD. Significant industrial users (SIUs) discharge to the collection systems of the FMC and Massaponax WWTPs only. However, the Thornburg STP must receive a requirement in this permit to conduct an industrial user survey because it owned and operated by Spotsylvania County even though it probably does not have SIUs that discharge to its collection system. If it was found that the Thornburg STP receives discharge from a SIU, local limits will have to be developed for the POTW and the SIU would have to be permitted by the county.

21. Other Special Conditions:

a. 95% Capacity Reopener. The VPDES Permit Regulation at 9 VAC 25-31-200.B.2. requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b. Indirect Dischargers. Required by VPDES Permit Regulation, 9 VAC 25-31-280 B.9 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c. O&M Manual Requirement. Required by the Code of Virginia (§62.1-44.19), the Sewage Collection and Treatment Regulations (9 VAC 25-790); and the VPDES Permit Regulation (9 VAC 25-31-190.E). Within 90 days of the effective date of this permit, the permittee shall submit for approval an Operations and Maintenance (O&M) Manual or a statement confirming the accuracy and completeness of the current O&M Manual to the Department of Environmental Quality, Northern Regional Office (DEQ-NRO). Future changes to the facility must be addressed by the submittal of a revised O&M Manual within 90 days of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. CTC, CTO Requirement. The Code of Virginia (§ 62.1-44.19) and the Sewage Collection and Treatment Regulations (9 VAC 25-790) requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

e. Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq., the VPDES Permit Regulation at 9 VAC 25-31-200 C, and Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.) requires licensure of operators. This facility requires a Class II operator.

f. Reliability Class. The Sewage Collection and Treatment Regulation at 9 VAC 25-790 requires sewerage works achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. This facility is required to meet reliability Class I.

g. Water Quality Criteria Reopener. The VPDES Permit Regulation at 9 VAC 25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should data collected and submitted for metals in Attachment A of the permit indicate the need for limits to ensure protection of water quality criteria, the permit may be modified or alternately revoked and reissued to impose such water quality-based limitations.

h. Water Quality Criteria Monitoring. State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems or the attainment of water quality goals according to 40 CFR Part 131, Water Quality Standards, Subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the metals noted in Attachment A of this VPDES permit.

i. Sludge Reopener. The VPDES Permit Regulation at 9 VAC 25-31-200.C.4. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

j. Sludge Use and Disposal. The VPDES Permit Regulation at 9 VAC 25-31-100.P., 220.B.2., and 420-720 and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

k. TMDL Reopener. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL that may be developed and approved for the receiving stream.

22. Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

1. The Water Quality Monitoring Special Condition has been added.

24. Variances/Alternate Limits or Conditions: None

25. Public Notice Information:

First Public Notice Date: December 21, 2009 Second Public Notice Date: December 28, 2009

Public Notice Information is required by 9 VAC 25-31-280 B. All pertinent information is on file and may be inspected and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3837, anna.westernik@deq.virginia.gov. See **Attachment 11** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

26. 303 (d) Listed Stream Segments and Total Max. Daily Loads (TMDL):

The receiving stream for the Thornburg Community STP (an unnamed tributary of the Po River) flows into the Po River, which in turn flows into the Poni River. The Poni River flows into the Mattaponi River, which has several downstream impairments. The receiving stream is not impaired. Additionally, a wasteload allocation has not been assigned to the Thornburg Community STP as there are no approved downstream TMDLs as of this date . TMDLs will be prepared for the downstream segments of the Mattaponi River per the following schedule described below:

VAN-F17R_MPN02A02
Recreation Use Impairment: TMDL due 2018
Aquatic Life Use Impairment: TMDL due 2018

VAN-F17R_MPN01A02
Recreation Use Impairment: TMDL due 2020

VAN-F21R_MPN01B02
Fish Consumption Use Impairment: TMDL due 2018

VAN-F21R_MPN01A06
Fish Consumption Use Impairment: TMDL due 2018

The Mattaponi River segment (VAN-F17R_MPN02A02) that begins at the confluence with Campbell Creek and continues downstream until the confluence with the South River, is listed as not supporting the (1) recreation use and (2) aquatic life use.

1. Recreation Use: Sufficient excursions from the instantaneous *E. coli* bacteria criterion (3 of 25 samples - 12.0%) were recorded at DEQ's ambient water quality monitoring station (8-MPN094.79) at the Route 605 crossing to assess this stream segment as not supporting of the recreation use goal for the 2008 water quality assessment.

2. Aquatic Life Use: Sufficient excursions below the lower limit of the pH criterion range (4 of 26 samples - 15.4%) were recorded at DEQ's ambient water quality monitoring station (8-MPN094.79) at the Route 605 crossing to assess this stream segment as not supporting of the aquatic life use goal for the 2008 water quality assessment.

Segment VAN-F17R_MPN01A02 of the Mattaponi River begins at the confluence with an unnamed tributary, draining from Goose Pond, and continues downstream until the confluence with Polecat Creek at the outlet of waterbody F17R and is listed as not supporting the recreation use. Sufficient excursions from the instantaneous *E. coli* bacteria criterion (2 of 6 samples - 33.3%) were recorded at DEQ's ambient water quality monitoring station (8-MPN083.62) at the Route 301 crossing to assess this stream segment as not supporting of the recreation use goal for the 2008 water quality assessment.

Mattaponi River segment (VAN-F21R_MPN01C02), which begins at the confluence with Maracossic Creek and continues downstream until the Route 628 crossing, is listed as not supporting the aquatic life use. Sufficient excursions below the lower limit of the pH criterion range were recorded at the DEQ water quality monitoring station (8-MPN054.17) at the Route 628 bridge and USGS station 01674500 to assess this segment as not supporting the aquatic life use goal. Combining the data from both stations, which are co-located, 32 of 163 samples (19.6%) were below the lower range of the pH criterion.

Mattaponi River segment (VAN-F21R_MPN01B02), which begins at the Route 628 crossing and continues downstream until the confluence with Gravel Run is listed as not supporting the (1) aquatic life use and (2) fish consumption use.

1. Aquatic Life Use: Sufficient excursions below the lower limit of the pH criterion range were recorded at the DEQ water quality monitoring station (8-MPN054.17) at the Route 628 Bridge and USGS station 01674500 to assess this segment as not supporting the aquatic life use goal. Combining the data from both stations, which are colocated, 32 of 163 samples (19.6%) were below the lower range of the pH criterion.

2. Fish Consumption Use: The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury fish consumption advisory. The advisory, dated 09/30/04, limits largemouth bass consumption to no more than two meals per month. The affected area extends from the Route 628 bridge and continues downstream approximately 40 miles, to Melrose Landing at Route 602.

Segment VAN-F21R_MPN01A06 of the Mattaponi River begins at the confluence with Gravel Run and continues downstream until the confluence with Herring Creek and is listed as not supporting the fish consumption use. The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury fish consumption advisory. The advisory, dated 09/30/04, limits largemouth bass consumption to no more than two meals per month. The affected area extends from the Route 628 Bridge and continues downstream approximately 40 miles, to Melrose Landing at Route 602.

27. Additional Comments:

Previous Board Action(s):	None
Public Comment:	No comments were received during the public notice period.
EPA Checklist:	The checklist can be found in **Attachment 12**.

Attachments

Attachment 1	Flow Frequency Analyses
Attachment 2	Treatment System Schematic/Flow Diagram
Attachment 3	Spotsylvania Quadrangle Topographic Map
Attachment 4	Site Inspection Performed by Anna Westernik on July 16, 2009
Attachment 5	Planning Statement for the Thornburg Community STP
Attachment 6	Water Quality Criteria and WLA Analysis
Attachment 7	Derivation of the 90th Percentile Values of the Effluent pH and Temperature Data (September 2008 Through September 2009)
Attachment 8	Ammonia Effluent Limits Derivation
Attachment 9	TRC Effluent Limits Derivation
Attachment 10	Stream Modeling Conducted In August 1986
Attachment 11	Public Notice
Attachment 12	EPA Checklist

Flow Frequency Determination
Anna T. Westernik – NRO Water Permit Writer
October 9, 2009

Thornburg WWTP
VA0029513

Paul Herman last did the flow determination in 1999. See the May 24, 1999 memo attached to this memo. Mr. Herman used drainage area proportions to determine the flows at the discharge point. The same approach was used for this determination. Flow data from 1963 through 2003 was verified using gaging station #01673800 on the Po River near Spotsylvania, VA as the reference station. The values presented at the discharge point do not address any withdrawals, discharges, or springs lying upstream.

Po River Near Spotsylvania Virginia (#01673800):

Drainage Area = 77.4 sq. mi.

1Q10 = 0.12 cfs	High Flow 7Q10 = 6.0 cfs
7Q10 = 0.17 cfs	High Flow 1Q10 = 4.3 cfs
30Q10 = 0.26 cfs	High Flow 30Q10 = 12 cfs
30Q5 = 0.63 cfs	Harmonic Mean = 4.4 cfs

UT, Po River at discharge point:

Drainage Area = 0.19 sq. mi.

1Q10 = 0.0003 cfs	1Q10 = 0.00019 mgd
7Q10 = 0.0042 cfs	7Q10 = 0.00027 mgd
30Q5 = 0.0015 cfs	30Q5 = 0010 mgd
30Q10 = 0.0064 cfs	30Q10 = 0.0010 mgd
High Flow 7Q10 = 0.015 cfs	High Flow 7Q10 = 0.0095mgd
High Flow 1Q10 = 0.010 cfs	High Flow 1Q10 = 0.0068 mgd
High Flow 30Q10 = 0.029 cfs	High Flow 30Q10 = 0.019 mgd
Harmonic Mean = 0.011 cfs	Harmonic Mean = 0.0070mgd

High flow months are December through May.

The receiving stream is intermittent at the discharge point. The flow frequencies for intermittent streams are considered to be 0.0 cfs.

Attachment 1

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Office of Water Quality Assessments
629 East Main Street P.O. Box 10009 Richmond, Virginia 23219

SUBJECT: Flow Frequency Determination
Thornburg WWTP – #VA0029513

TO: Kenneth Blodgett, NRO

FROM: Paul E. Herman, P.E., WQAP

DATE: May 24, 1999

COPIES: Ron Gregory, Charles Martin, File

This memo supersedes my May 12, 1994, memo to Raymond Jay concerning the subject VPDES permit.

The Thornburg WWTP discharges to an unnamed tributary of the Po River near Thornburg, Virginia. Flow frequencies are required at this site for use by the permit writer in developing the VPDES permit.

The flow frequencies for the discharge receiving stream were determined by inspection of the USGS Spotsylvania Quadrangle topographic map. The map depicts the stream as intermittent at the discharge point. The flow frequencies for intermittent streams are 0.0 cfs for the 1Q10, 7Q10, 30Q5, high flow 1Q10, high flow 7Q10, and harmonic mean. For modeling purposes, flow frequencies have been determined for the first perennial reach downstream of the discharge point.

The VDEQ has operated a continuous record gage on the Po River near Spotsylvania, VA (#01673800) since 1962. The gage is located approximately 4.0 miles east of the discharge point, at the Route 738 bridge , in Spotsylvania County, VA. The flow frequencies for the perennial point were determined using drainage area proportions and do not address any withdrawals, discharges, or springs that may lie upstream. The flow frequencies for the gage and the perennial point are presented below.

Po River near Spotsylvania, VA (#01673800):

Drainage Area = 77.4 mi^2

1Q10 = 0.13 cfs	High Flow 1Q10 = 6.2 cfs
7Q10 = 0.18 cfs	High Flow 7Q10 = 9.1 cfs
30Q5 = 0.77 cfs	HM = 4.4 cfs

UT to Po River at perennial point (above pond):

Drainage Area = 0.44 mi^2

1Q10 = 0.0007 cfs	High Flow 1Q10 = 0.035 cfs
7Q10 = 0.0010 cfs	High Flow 7Q10 = 0.052 cfs
30Q5 = 0.0044 cfs	HM = 0.0 cfs

The high flow months are December through May. The harmonic mean is zero because of the zero flow events anticipated to occur at the perennial point (refer to the very low 1Q10 value for the perennial point).

If you have any questions concerning this analysis, please let me know.

Attachment 1

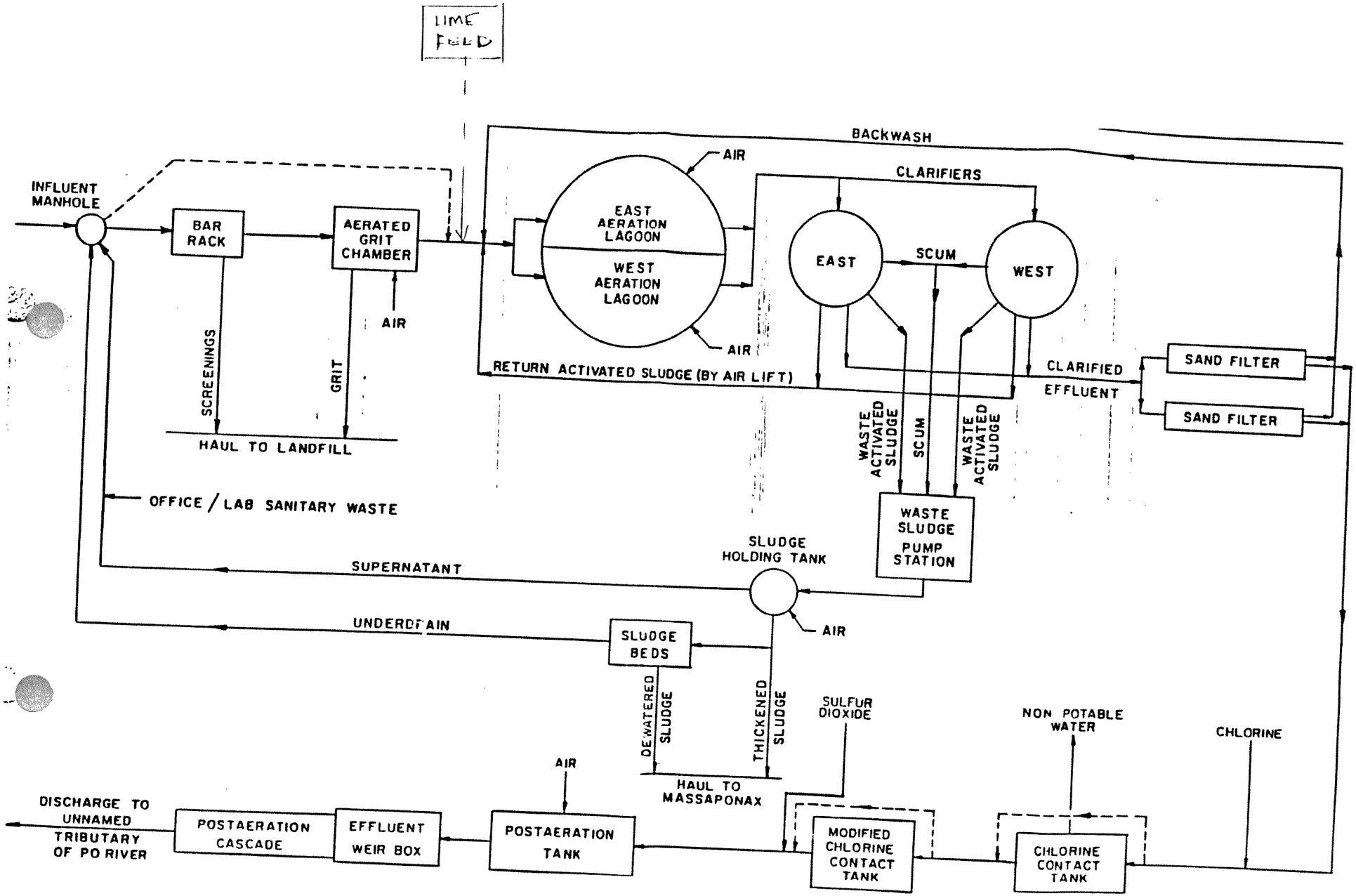
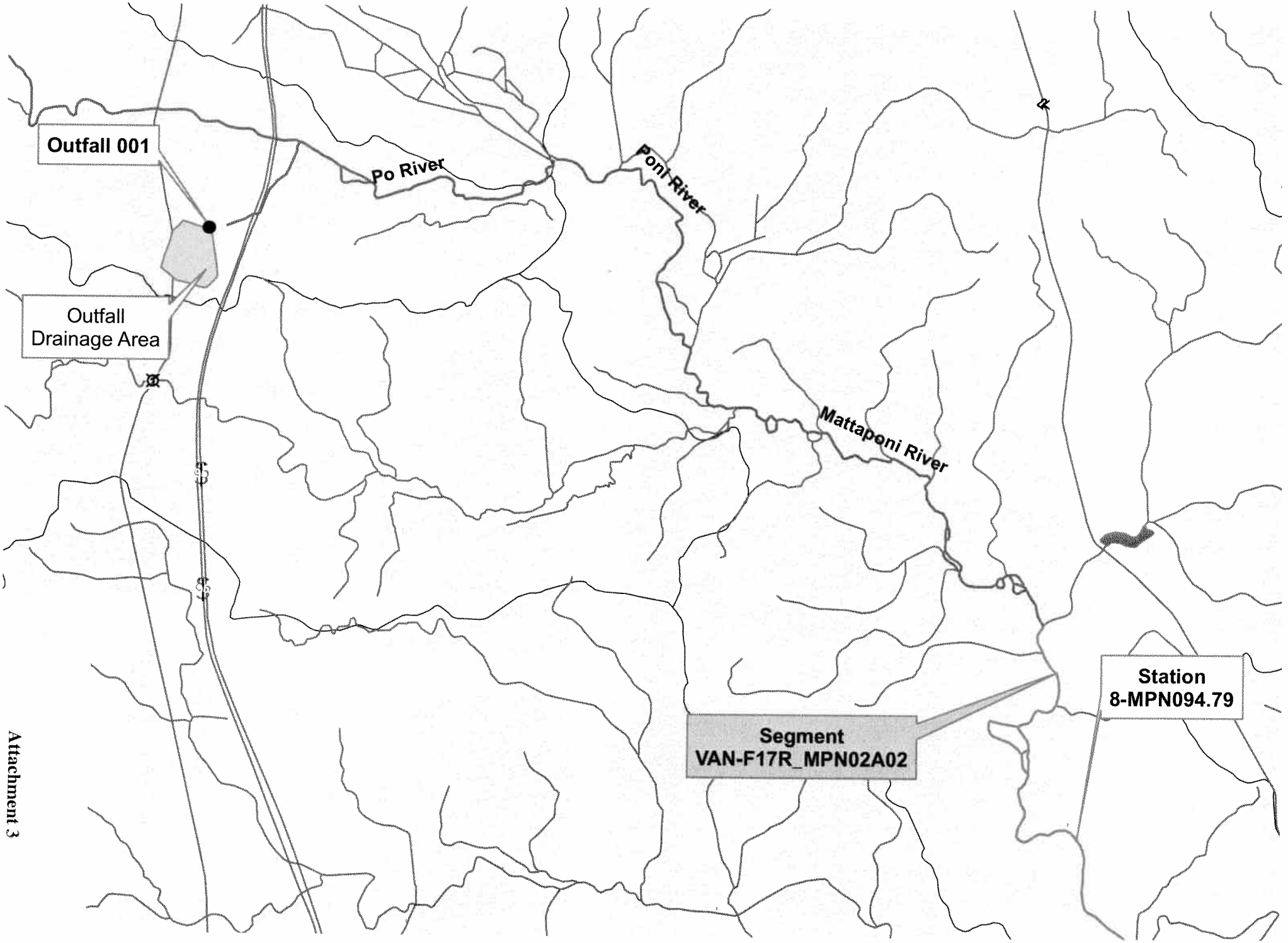


FIGURE 1.5-1
PROCESS FLOW DIAGRAM
THORNBURG
WASTEWATER TREATMENT PLANT
COUNTY OF SPOTSYLVANIA, VIRGINIA

Attachment 2



Attachment 3

August 10, 2009

MEMORANDUM

To: The Thornburg Community STP 2009 Permit Reissuance File

From: Anna Westernik

Subject: July 16, 2009 Visit to the Thornburg WWTP VA0029513

A site visit was made to the Thornburg WWTP on July 16, 2009 for the purpose of touring the facility prior to reissuing the permit.

Wastewater treatment for this 0.345MGD plant consists of a manual bar screen and aerated grit chamber, two aerated lagoons (one is operational during the warmer months and two are operational during the colder months), secondary clarifiers, sand filtration, chlorination, dechlorination and post aeration.

On December 9, 2003, the automatic lime feed system was placed online. A portion of the filter backwash water is pumped to a vat where it continuously mixed with lime. This solution is delivered to the head of the plant through the filter backwash line at a continuous rate. The permittee states that this treatment unit will maintain average and minimum hardness values in the effluent of 175 mg/l and 150 mg/l, respectively. DEQ staff has used the minimum hardness value of 150 mg/l to determine the need for copper and zinc limits at this facility.

Two chlorine contact tanks operate in series. 12.5% sodium hydroxide is added prior to the chlorine contact tanks. The effluent is metered after dechlorination with sodium bisulfite and post-aeration.

All chemicals at the sewage treatment plant are stored using secondary containment.

The waste sludge tank is pumped daily to a sludge holding tank. Every two weeks the waste sludge is hauled from this tank to the FMC sewage treatment plant for treatment.

Outfall 001 discharges to an unnamed tributary to the Po River. Flow was observed in the river. The unnamed tributary is a fairly flat meandering stream with a gravel bottom. The effluent was clear and aquatic life was observed in the stream.

To: Anna T. Westernik
From: Jennifer O'Reilly

Date: September 29, 2009
Subject: Planning Statement for Thornburg Community STP
Permit No: VA0029513

Discharge Type: Municipal
Discharge Flow: Currently 0.345 MGD

Receiving Stream: UT of the Po River
Latitude / Longitude: 38° 08'09"/77°30'58"
Waterbody ID: F16/YO41

1. Is there monitoring data for the receiving stream?

   There is no monitoring data for the unnamed tributary to the Po River.

   - If yes, please attach latest summary.
   - If no, where is the nearest downstream monitoring station.

   The unnamed tributary flows into Po River, which in turn flows into the Poni River. The Poni River flows into the Mattaponi River. The nearest downstream monitoring station is DEQ ambient monitoring station 8-MPN094.79 at the Rt. 605 bridge crossing, located approximately 14.1 miles downstream from Outfall 001. The following information is the monitoring summary for 8-MPN094.79, as taken from the 2008 Intergrated Assessment:

   Class III, Section 3.

   DEQ ambient water quality monitoring stations 8-MPN094.79, at Route 605, and 8-MPN094.94, at the old bridge upstream from Route 605.

   E.coli monitoring finds a bacteria impairment, resulting in an impaired classification for the recreation use. Ambient monitoring finds a pH impairment, resulting in an impaired classification for the aquatic life use. The pH impairment may be due to natural conditions. The wildlife use is considered fully supporting. The fish consumption use was not assessed.

2. Is the receiving stream on the current 303(d) list?

   No. The unnamed tributary to the Po River is not on the current 303(d) list.

   - If yes, what is the impairment?

   N/A

   - Has the TMDL been prepared?

Attachment 5

N/A

- If yes, what is the WLA for the discharge?

N/A

- If no, what is the schedule for the TMDL?

N/A

3. If the answer to (2) above is no, is there a downstream 303(d) listed impairment?

Yes, the unnamed tributary flows into the Po River, which in turn flows into the Poni River. The Poni River flows into the Mattaponi River, which has several downstream impairments.

- If yes, what is the impairment?

The Mattaponi River segment (VAN-F17R_MPN02A02) that begins at the confluence with Campbell Creek and continues downstream until the confluence with the South River, is listed as not supporting the (1) recreation use and (2) aquatic life use.

1. Recreation Use: Sufficient excursions from the instantaneous E. coli bacteria criterion (3 of 25 samples - 12.0%) were recorded at DEQ's ambient water quality monitoring station (8-MPN094.79) at the Route 605 crossing to assess this stream segment as not supporting of the recreation use goal for the 2008 water quality assessment.

2. Aquatic Life Use: Sufficient excursions below the lower limit of the pH criterion range (4 of 26 samples - 15.4%) were recorded at DEQ's ambient water quality monitoring station (8-MPN094.79) at the Route 605 crossing to assess this stream segment as not supporting of the aquatic life use goal for the 2008 water quality assessment.

Segment VAN-F17R_MPN01A02 of the Mattaponi River begins at the confluence with an unnamed tributary, draining from Goose Pond, and continues downstream until the confluence with Polecat Creek at the outlet of waterbody F17R and is listed as not supporting the recreation use. Sufficient excursions from the instantaneous E. coli bacteria criterion (2 of 6 samples - 33.3%) were recorded at DEQ's ambient water quality monitoring station (8-MPN083.62) at the Route 301 crossing to assess this stream segment as not supporting of the recreation use goal for the 2008 water quality assessment.

Mattaponi River segment (VAN-F21R_MPN01C02), which begins at the confluence with Maracossic Creek and continues downstream until the Route 628 crossing, is listed as not supporting the aquatic life use. Sufficient excursions below the lower limit of the pH criterion range were recorded at the DEQ water quality monitoring station (8-MPN054.17) at the Route 628 bridge and USGS station 01674500 to assess this segment as not supporting the aquatic life use goal. Combining the data from both stations, which are colocated, 32 of 163 samples (19.6%) were below the lower range of the pH criterion.

Mattaponi River segment (VAN-F21R_MPN01B02), which begins at the Route 628 crossing and continues downstream until the confluence with Gravel Run is listed as not supporting the (1) aquatic life use and (2) fish consumption use.

1. Aquatic Life Use: Sufficient excursions below the lower limit of the pH criterion range were recorded at the DEQ water quality monitoring station (8-MPN054.17) at the Route 628 bridge and USGS station 01674500 to assess this segment as not supporting the aquatic life use goal. Combining the data from both stations, which are colocated, 32 of 163 samples (19.6%) were below the lower range of the pH criterion.

2. Fish Consumption Use: The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury fish consumption advisory. The advisory, dated 09/30/04, limits largemouth bass consumption to no more than two meals per month. The affected area extends from the Route 628 bridge and continues downstream approximately 40 miles, to Melrose Landing at Route 602.

Segment VAN-F21R_MPN01A06 of the Mattaponi River begins at the confluence with Gravel Run and continues downstream until the confluence with Herring Creek and is listed as not supporting the fish consumption use. The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, mercury fish consumption advisory. The advisory, dated 09/30/04, limits largemouth bass consumption to no more than two meals per month. The affected area extends from the Route 628 bridge and continues downstream approximately 40 miles, to Melrose Landing at Route 602.

- Has a TMDL been prepared?

No TMDLs have been prepared to date.

- Will the TMDL include the receiving stream?

The unnamed tributary to Po River will not be specifically included in the TMDL, but all upstream facilities will be taken into account during the TMDL development.

- Is there a WLA for the discharge?

A bacteria TMDL has not yet been prepared, so there is not a WLA for the discharge at this time.

- What is the schedule for the TMDL?

VAN-F17R_MPN02A02
Recreation Use Impairment: TMDL due 2018
Aquatic Life Use Impairment: TMDL due 2018

VAN-F17R_MPN01A02
Recreation Use Impairment: TMDL due 2020

VAN-F21R_MPN01C02

Aquatic Life Use Impairment: *

VAN-F21R_MPN01B02
Aquatic Life Use Impairment: *
Fish Consumption Use Impairment: TMDL due 2018

VAN-F21R_MPN01A06
Fish Consumption Use Impairment: TMDL due 2018

* DEQ performed the assessment of the Mattaponi River low pH natural condition in lieu of a TMDL to investigate and justify the classification of the impaired segments as Class VII Swampwater. The following is the conclusion of the Mattaponi River low pH TMDL Assessment as taken from the "Natural Conditions Assessment for Low pH, Mattaponi River, Caroline, King William, King and Queen Counties, Virginia" Report:

> *...a change in the water quality standards classification to Class VII Swampwater due to natural conditions, rather than a TMDL, is indicated for the Mattaponi River from its confluence with Maracossic Creek at rivermile 57.17 downstream to the tidal confluence with Garnetts Creek at rivermile 23.60. Garnetts Creek is half way between station 8-MPN029.08 at Walkerton and station 8-MPN017.46 at Wakema, where low pH occurs less than 10 percent of samples. The total miles classified as Swampwaters are 33.57 rivermiles and 1.96 estuarine square miles.*

The reclassification of this segment of the Mattaponi River is scheduled to be finalized as part of the Triennial Review in the fall of 2009.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

   There are no other needs or conditions at this time.

5. What is the area of the drainage area above the outfall?

   The drainage area is 0.19 mi^2.

Attachment 6

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Thornburg WWTP Permit No.: VA0029513

Receiving Stream: Po River UT Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	mg/L
90% Temperature (Annual) =	deg C
90% Temperature (Wet season) =	deg C
90% Maximum pH =	SU
10% Maximum pH =	SU
Tier Designation (1 or 2) =	1
Public Water Supply (PWS) Y/N? =	n
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	0 MGD
7Q10 (Annual) =	0 MGD
30Q10 (Annual) =	0 MGD
1Q10 (Wet season) =	0 MGD
30Q10 (Wet season)	0 MGD
30Q5 =	0 MGD
Harmonic Mean =	0 MGD

Mixing Information

Annual - 1Q10 Mix =	100 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	100 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	150 mg/L
90% Temp (Annual) =	23 deg C
90% Temp (Wet season) =	deg C
90% Maximum pH =	7.52 SU
10% Maximum pH =	6.68 SU
Discharge Flow =	0.345 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+02
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	--	--	--	--	na	9.3E+00
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+00
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	3.0E+00	--	na	5.0E-04
Ammonia-N (mg/l) (Yearly)	0	1.93E+01	2.48E+00	na	--	1.9E+01	2.5E+00	na	--	--	--	--	--	--	--	--	--	1.9E+01	2.5E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	1.93E+01	4.29E+00	na	--	1.9E+01	4.3E+00	na	--	--	--	--	--	--	--	--	--	1.9E+01	4.3E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	--	--	na	4.0E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	--	--	--	--	na	6.4E+02
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+02
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-03
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+00
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+01
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
Cadmium	0	6.2E+00	1.6E+00	na	--	6.2E+00	1.6E+00	na	--	--	--	--	--	--	--	--	--	6.2E+00	1.6E+00	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+01
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	8.1E-03
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	**1.9E+01**	**1.1E+01**	**na**	**--**
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+03**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	**na**	**1.3E+02**
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	**na**	**1.1E+04**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	**na**	**1.6E+03**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	**na**	**1.5E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	**8.3E-02**	**4.1E-02**	**na**	**--**
Chromium III	0	7.9E+02	1.0E+02	na	--	7.9E+02	1.0E+02	na	--	--	--	--	--	--	--	--	--	**7.9E+02**	**1.0E+02**	**na**	**--**
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	**1.6E+01**	**1.1E+01**	**na**	**--**
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Chrysene[C]	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E-02**
Copper	0	2.0E+01	1.3E+01	na	--	2.0E+01	1.3E+01	na	--	--	--	--	--	--	--	--	--	**2.0E+01**	**1.3E+01**	**na**	**--**
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	--	--	--	--	--	--	--	--	**2.2E+01**	**5.2E+00**	**na**	**1.6E+04**
DDD[C]	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.1E-03**
DDE[C]	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.2E-03**
DDT[C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	--	--	--	--	--	--	--	--	**1.1E+00**	**1.0E-03**	**na**	**2.2E-03**
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	**--**	**1.0E-01**	**na**	**--**
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	--	--	**1.7E-01**	**1.7E-01**	**na**	**--**
Dibenz(a,h)anthracene[C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E-01**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+03**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.6E+02**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.9E+02**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.8E-01**
Dichlorobromomethane[C]	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+02**
1,2-Dichloroethane[C]	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.7E+02**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.1E+03**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.0E+04**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.9E+02**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+02**
1,3-Dichloropropene[C]	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.1E+02**
Dieldrin[C]	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	--	--	--	--	--	--	--	--	**2.4E-01**	**5.6E-02**	**na**	**5.4E-04**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.4E+04**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.5E+02**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+06**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.5E+03**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.3E+03**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.8E+02**
2,4-Dinitrotoluene[C]	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.4E+01**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.1E-08**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+00**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	**na**	**8.9E+01**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	**na**	**8.9E+01**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	**--**	**--**
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.9E+01**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	--	--	--	--	--	--	--	--	**8.6E-02**	**3.6E-02**	**na**	**6.0E-02**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	1.4E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	7.9E-04
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	3.9E-04
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-03
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+02
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-02
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	1.8E+00
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+03
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	2.0E+02	2.3E+01	na	--	2.0E+02	2.3E+01	na	--	--	--	--	--	--	--	--	--	2.0E+02	2.3E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	- -	- -	1.4E+00	7.7E-01	- -	- -	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	- -	- -
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	2.6E+02	2.9E+01	na	4.6E+03	2.6E+02	2.9E+01	na	4.6E+03	--	--	--	--	--	--	--	--	2.6E+02	2.9E+01	na	4.6E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	6.9E+02
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+01
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+01
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	na	6.4E-04
Pentachlorophenol [C]	0	6.3E+00	4.9E+00	na	3.0E+01	6.3E+00	4.9E+00	na	3.0E+01	--	--	--	--	--	--	--	--	6.3E+00	4.9E+00	na	3.0E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	8.6E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+00

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**4.2E+03**
Silver	0	6.9E+00	--	na	--	6.9E+00	--	na	--	--	--	--	--	--	--	--	--	**6.9E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+01**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+01**
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E-01**
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.0E+03**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**2.8E-03**
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.0E+01**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+02**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E+02**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
Zinc	0	1.7E+02	1.7E+02	na	2.6E+04	1.7E+02	1.7E+02	na	2.6E+04	--	--	--	--	--	--	--	--	**1.7E+02**	**1.7E+02**	**na**	**2.6E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.4E+02
Arsenic	9.0E+01
Barium	na
Cadmium	9.4E-01
Chromium III	6.2E+01
Chromium VI	6.4E+00
Copper	7.6E+00
Iron	na
Lead	1.4E+01
Manganese	na
Mercury	4.6E-01
Nickel	1.7E+01
Selenium	3.0E+00
Silver	2.8E+00
Zinc	6.6E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

0.345 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGI 0.345

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	0.000	0.000	0.345	0.345
7Q10	0.000	N/A	0.345	N/A
30Q10	0.000	0.000	0.345	0.345
30Q5	0.000	N/A	0.345	N/A
Harm. Mean	0.000	N/A	0.345	N/A
Annual Avg.	0.000	N/A	0.345	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	23.000	0.000
30Q10 90th% Temp. Mix (deg C)	23.000	0.000
1Q10 90th% pH Mix (SU)	7.520	7.520
30Q10 90th% pH Mix (SU)	7.520	7.520
1Q10 10th% pH Mix (SU)	6.680	N/A
7Q10 10th% pH Mix (SU)	6.680	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	150.0	150.0
7Q10 Hardness (mg/L as CaCO3)	150.0	150.0

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	7.520
(7.204 - pH)	-0.316
(pH - 7.204)	0.316
Trout Present Criterion (mg N/	12.888
Trout Absent Criterion (mg N/L	19.299
Trout Present?	n
Effective Criterion (mg N/L)	19.299

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	23.000
90th Percentile pH (SU)	7.520
MIN	1.650
MAX	23.000
(7.688 - pH)	0.168
(pH - 7.688)	-0.168
Early LS Present Criterion (mg N	2.482
Early LS Absent Criterion (mg N	2.482
Early Life Stages Present?	y
Effective Criterion (mg N/L)	2.482

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	7.520
(7.204 - pH)	-0.316
(pH - 7.204)	0.316
Trout Present Criterion (mg N/	12.888
Trout Absent Criterion (mg N/L	19.299
Trout Present?	n
Effective Criterion (mg N/L)	19.299

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	0.000
90th Percentile pH (SU)	7.520
MIN	2.850
MAX	7.000
(7.688 - pH)	0.168
(pH - 7.688)	-0.168
Early LS Present Criterion (mg N	4.288
Early LS Absent Criterion (mg N	6.962
Early Life Stages Present?	y
Effective Criterion (mg N/L)	4.288

0.345 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGI 0.345

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	0.000	0.000	0.345	0.345
7Q10	0.000	N/A	0.345	N/A
30Q10	0.000	0.000	0.345	0.345
30Q5	0.000	N/A	0.345	N/A
Harm. Mean	0.000	N/A	0.345	N/A
Annual Avg.	0.000	N/A	0.345	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	23.000	0.000
30Q10 90th% Temp. Mix (deg C)	23.000	0.000
1Q10 90th% pH Mix (SU)	7.520	7.520
30Q10 90th% pH Mix (SU)	7.520	7.520
1Q10 10th% pH Mix (SU)	6.680	N/A
7Q10 10th% pH Mix (SU)	6.680	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	150.000	150.000
7Q10 Hardness (mg/L as CaCO3) =	150.000	150.000

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	7.520
(7.204 - pH)	-0.316
(pH - 7.204)	0.316
Trout Present Criterion (mg N/	12.888
Trout Absent Criterion (mg N/L	19.299
Trout Present?	n
Effective Criterion (mg N/L)	19.299

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	23.000
90th Percentile pH (SU)	7.520
MIN	1.650
MAX	23.000
(7.688 - pH)	0.168
(pH - 7.688)	-0.168
Early LS Present Criterion (mg N	2.482
Early LS Absent Criterion (mg N	2.482
Early Life Stages Present?	y
Effective Criterion (mg N/L)	2.482

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	7.520
(7.204 - pH)	-0.316
(pH - 7.204)	0.316
Trout Present Criterion (mg N/	12.888
Trout Absent Criterion (mg N/L	19.299
Trout Present?	n
Effective Criterion (mg N/L)	19.299

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	0.000
90th Percentile pH (SU)	7.520
MIN	2.850
MAX	7.000
(7.688 - pH)	0.168
(pH - 7.688)	-0.168
Early LS Present Criterion (mg N	4.288
Early LS Absent Criterion (mg N	6.962
Early Life Stages Present?	y
Effective Criterion (mg N/L)	4.288

The Thornburg Community WWTP (VA0029513)
pH and Temperature Data
Sep 2008 -- Sep 2009

	pH	Temperature
	6.83	22
	6.95	21
	6.87	21
	7.11	23
	6.57	20
	6.48	23
	6.66	22
	7.02	22
	7.16	23
	6.97	22
	7.19	21
	7.12	21
	7.09	22
	7.14	24
	7.07	25
	6.91	23
	6.71	21
	6.86	19
	6.93	20
	6.71	19
	6.79	18
	6.79	18
	6.60	19
	6.88	19
	6.66	18
	7.09	18
	6.64	19
	6.84	21
	6.96	21
	7.08	20
	7.08	20
	6.90	18
	7.02	17
	6.76	17
	6.95	17
	7.15	17
	7.15	16
	7.20	15
	7.13	16
	6.82	18
	6.67	18
	6.72	17
	6.96	17
	6.98	17
	7.05	18
	6.85	19
	6.76	19

Attachment 7

The Thornburg Community WWTP (VA0029513)
pH and Temperature Data
Sep 2008 -- Sep 2009

	6.72	17
	6.83	14
	6.85	13
	6.90	12
	7.01	12
	7.05	12
	6.79	12
	6.60	13
	6.84	15
	7.21	14
	7.15	12
	7.10	11
	7.04	10
	7.01	10
	7.00	10
	6.52	12
	6.68	13
	6.96	13
	6.77	14
	6.43	15
	7.17	15
	6.82	16
	6.83	14
	7.12	12
	7.14	11
	6.98	10
	6.79	10
	6.79	12
	7.10	14
	6.63	14
	6.96	11
	6.97	9
	6.94	8
	6.98	7
	7.15	7
	7.07	6
	7.27	5
	7.24	5
	6.91	7
	7.26	7
	7.14	6
	7.03	7
	6.94	7
	7.01	7
	6.77	9
	6.82	8
	7.00	7
	6.86	7
	6.55	8
	7.30	6
	7.01	5
	7.16	5

The Thornburg Community WWTP (VA0029513)
pH and Temperature Data
Sep 2008 -- Sep 2009

	7.10	5
	7.05	8
	7.07	12
	6.75	10
	6.86	8
	7.14	7
	7.25	8
	7.14	11
	6.83	9
	7.06	10
	6.96	10
	6.99	10
	7.15	9
	7.02	7
	6.84	5
	7.02	5
	7.03	7
	7.09	7
	6.86	7
	6.89	11
	6.91	11
	6.95	9
	6.98	8
	6.94	6
	6.95	5
	6.95	6
	6.74	6
	6.76	7
	6.73	7
	6.84	7
	6.62	8
	6.82	7
	6.90	6
	6.94	8
	7.07	7
	7.08	6
	7.00	6
	6.85	5
	6.82	3
	6.79	2
	6.82	2
	6.95	3
	6.97	4
	6.94	3
	6.94	3
	6.96	4
	7.07	5
	6.89	5
	6.97	5
	6.98	4
	7.03	5
	7.08	5

The Thornburg Community WWTP (VA0029513)
pH and Temperature Data
Sep 2008 -- Sep 2009

	6.72	6
	6.8	5
	6.74	5
	6.86	7
	7.07	7
	6.98	6
	6.96	5
	6.61	4
	6.56	4
	6.97	6
	7.14	7
	7.03	8
	7.00	9
	7.27	10
	6.95	10
	7.02	9
	6.77	8
	6.89	7
	6.80	6
	6.71	6
	6.86	7
	6.72	7
	6.75	6
	6.92	6
	6.83	6
	6.95	5
	6.75	5
	6.76	5
	6.85	8
	6.75	9
	6.64	8
	6.40	6
	6.70	4
	6.75	4
	6.83	4
	6.64	6
	6.62	9
	6.82	11
	6.90	12
	6.82	12
	6.86	12
	6.71	11
	6.57	10
	6.67	8
	6.66	8
	6.94	9
	6.97	9
	6.85	10
	6.90	11
	6.81	11
	6.76	9
	6.76	8

The Thornburg Community WWTP (VA0029513)
pH and Temperature Data
Sep 2008 -- Sep 2009

	6.65	9
	6.71	9
	7.75	8
	6.68	8
	6.85	9
	6.85	11
	6.72	12
	6.95	12
	6.82	11
	6.77	11
	6.72	12
	6.79	13
	6.80	13
	6.91	12
	6.90	13
	7.07	13
	6.67	10
	6.75	10
	6.65	11
	6.63	12
	6.89	12
	6.93	11
	6.80	11
	6.79	11
	6.96	12
	6.84	12
	6.75	13
	6.50	13
	6.56	13
	6.66	15
	6.76	14
	6.88	13
	6.70	13
	6.54	14
	6.50	17
	6.67	18
	6.66	18
	6.80	18
	6.34	15
	6.44	16
	6.68	17
	6.62	17
	6.69	16
	7.08	16
	7.03	15
	7.11	16
	7.16	17
	7.10	18
	7.07	19
	7.22	17
	7.05	16
	7.12	15

The Thornburg Community WWTP (VA0029513)
pH and Temperature Data
Sep 2008 -- Sep 2009

	6.66	15
	6.80	18
	6.32	19
	6.70	20
	6.94	16
	6.98	14
	7.51	15
	7.28	15
	7.20	17
	6.99	18
	6.95	20
	6.96	21
	6.93	21
	6.99	20
	7.28	20
	7.33	21
	7.35	21
	7.00	20
	7.26	20
	7.21	19
	6.87	20
	6.98	20
	7.13	18
	7.54	18
	7.48	19
	7.24	20
	7.27	22
	7.20	21
	7.07	21
	6.99	22
	7.01	22
	7.38	22
	7.50	21
	7.63	21
	7.57	20
	7.41	21
	7.37	22
	7.55	22
	7.31	23
	7.58	22
	7.54	22
	7.42	22
	7.43	22
	7.08	23
	7.18	23
	7.16	22
	7.11	22
	7.06	22
	7.30	22
	7.17	22
	7.35	21
	7.22	21

The Thornburg Community WWTP (VA0029513)
pH and Temperature Data
Sep 2008 -- Sep 2009

	7.21	21
	7.41	21
	7.54	22
	7.31	22
	7.41	21
	7.52	21
	7.63	21
	7.36	23
	7.50	24
	7.28	23
	7.29	21
	7.50	23
	7.50	24
	7.50	24
	7.22	22
	7.47	22
	7.68	22
	7.54	22
	7.45	23
	7.59	24
	7.14	23
	7.10	24
	7.18	24
	7.46	24
	7.65	24
	7.32	24
	7.22	25
	7.34	24
	7.15	25
	7.27	25
	7.18	24
	7.20	24
	6.98	23
	7.28	22
	7.26	22
	7.23	24
	7.30	25
	7.37	25
	7.41	25
	7.67	24
	7.74	23
	7.47	24
	7.42	24
	7.52	24
	7.40	24
	7.44	25
	7.27	25
	7.48	25
	7.34	25
	6.90	24
	7.34	24
	7.70	23

The Thornburg Community WWTP (VA0029513)
pH and Temperature Data
Sep 2008 -- Sep 2009

	7.52	23
	7.37	24
	7.79	24
	7.54	23
	7.44	24
	7.71	22
	7.70	20
	7.59	19
	7.89	19
	7.53	20
	7.54	21
	7.35	21
	7.36	21
	7.59	22
	7.56	21
	7.56	21
	7.60	20
	7.55	19
	7.36	20
	7.18	20
	7.45	21
	7.52	21
	7.22	21
	7.43	20
	7.69	21
	7.34	20
	7.61	19
	7.69	20
	7.26	21
	7.62	22
	7.61	23
	7.60	20
	7.41	19
	7.54	19
	7.46	18
	7.64	17
90th Percentile	**7.52**	**23**
10th Percentile	**6.68**	**6**

Analysis of the Thornbur effluent data for ammonia
Averaging period for standard = 30 days

Current Ammonia limits

The statistics for ammonia are:

Number of values	=	1
Quantification level	=	.2
Number < quantification	=	0
Expected value	=	10
Variance	=	36.00001
C.V.	=	.6
97th percentile	=	24.33418
Statistics used	=	Reasonable potential assumptions - Type 2 data

The WLAs for ammonia are:

Acute WLA	=	11.93
Chronic WLA	=	2.05
Human Health WLA	=	----

Limits are based on chronic toxicity and 12 samples/month, 3 samples/week

Maximum daily limit	=	4.136224	(3.0 mg/l)
Average weekly limit	=	3.025415	
Average monthly limit	=	2.253538	(2.3 mg/l)

Note: The maximum daily limit applies to industrial dischargers
The average weekly limit applies to POTWs
The average monthly limit applies to both.

The Data are
10

Recalculated Ammonia limits

11/6/2009 2:13:31 PM

Facility = Thornburg WWTP
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 19
WLAc = 2.48
Q.L. = .2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 5.00382183167245
Average Weekly limit = 5.00382183167245
Average Monthly LImit = 5.00382183167245

The data are:

9

11/6/2009 2:17:04 PM

Facility = Thornburg WWTP
Chemical = TRC
Chronic averaging period = 4
WLAa = 19
WLAc = 11
Q.L. = 100
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683
97th percentile 4 day average = 332.758
97th percentile 30 day average= 241.210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 16.0883226245855
Average Weekly limit = 9.59676626920107
Average Monthly LImit = 7.9737131838758

The data are:

200

2111 North Hamilton Street Richmond, VA. 23230

SUBJECT: Spotsylvania County: Stream Assimilations for Thornburg and Wishner Sewage Treatment Plants.

TO: Kitty Turner - OERS

FROM: Coleen Sullins - NRO Coleen

DATE: August 26, 1986

COPIES: Files

Ed - Looks good Kitty 9/4/86

Engineering consultants Hayes, Seay, Mattern and Mattern, have requested stream assimilation anaylses for the Thornburg STP discharge into an unnamed tributary of Po River and the Wishner STP discharge into the Ni River. Each assimilation impacts the other, see attached skematic.

Based on previous models, the allowed extent of dissolved oxygen degradation was to an instream DO level of 5.73 mg/l. The current model was developed allowing no further degradation of the Poni River. To the extent reasonable, the information used in the previous models was incorporated in the current assimilation performed. Any change in the information was based upon site inspections and the dry/drought conditions of this year.

The following parameters were changed:

1. The tributaries into which the J.J. Wright STP and the Thornburg STP discharge into were dry during the site inspection, flow was assumed in past models.

2. Several of the reaeration constants were changed based on new information. The justification for using these constants was that they were lower than previous constants and therefore would be more conservative (the writer feels they are more realistic, based on observed conditions).

In order to accurately assess the impact of increasing the amount of discharge into the Po River, the upstream conditions were evaluated. Above the Thornburg discharge are two other discharges, the JJ Wright STP and the Indian Acres STP. These two discharges were modeled to the confluence of the tributary into which the Thornburg STP discharges.

The following information was put into the Monroe Calculator for stretches #1-#3(calculations attached):

#1

1. BOD = 60
2. TKN = 0
3. Deficit = 1.55
4. Kd = .317
5. Kn = 0
6. Ka = 10.83
7. t = 0.2
8. DOs = 7.55

#2

1. BOD = 12.3
2. TKN = 0
3. Deficit = 1.11
4. Kd = 0.19
5. Kn = 0
6. Ka = 4.09
7. t = 1.6
8. DOs = 7.56

Attachment 10

#3

1. BOD = 37.4
2. TKN = 0
3. Deficit = 0.8
4. Kd = 0.268
5. Kn = 0
6. Ka = 4.09
7. t = 1.5
8. DOs = 7.56

At the bottom of stretch #3 the parameters were the following:

BOD_5 = 10.0 mg/l
DO = 5.81 mg/l

Stretch #4, x-tributary of Po River, containing the Thornburg dishcarge was modeled to the Po River, with the following parameters:

	Q STP MGD	BOD mg/l	DO mg/l
1.	0.175	24	6.8
2.	0.275	20	6.8
3.	0.345	20	7.0

Stretch #4:

		0.175	0.275	0.345
1.	BOD	60	50	50
2.	TKN	0	0	0
3.	Deficit	0.75	0.75	0.55
4.	Kd	0.317	0.269	0.269
5.	Kn	0	0	0
6.	Ka	13.8	13.8	13.8
7.	t	0.25	0.25	0.25
8.	DOs	7.55	7.55	7.55

The parameters at the end of the stretch were the following:

BOD_5	22.17mg/l	18.7mg/l	18.7mg/l
DO	6.29mg/l	6.65mg/l	6.65mg/l

Stretch #5, the Po River was modeled combining the discharges from upstream on the Po and the tributary containing Thornburg, to the confluence with the Ni River. From the previous models, the amount of dissolved oxygen in the Po River at the confluence with the Ni River was 6.0 mg/l. Using 6.0 mg/l as the lowest allowable level of dissolved oxygen in the river, the assimilations were run with the following parameters:

Thornburg:		0.175 MGD	0.275 MGD	0.345 MGD
1.	BOD	34.7	34.2	35.4
2.	TKN	0	0	0
3.	Deficit	1.6	1.4	1.35
4.	Kd	0.265	0.265	0.265
5.	Kn	0	0	0
6.	Ka	4.09	4.09	4.09
7.	t	1.6	1.6	1.6
8	DOs	7.57	7.57	7.57

The parameters at the end of the stretch were the following:

Thornburg STP	0.175 MGD	0.275 MGD	0.345 MGD
BOD_5	9.08 mg/l	8.95 mg/l	9.27 mg/l
DO	6.0 mg/l	6.02 mg/l	5.97 mg/l

Stretch #6, From the Wishner STP discharge to the confluence with the Po River. On this stretch, it was assumed that the Courthouse Lagoon was offline, as this is the purpose of upgrading the Wishner STP.

Information from the previous models was incorporated into stretch #6. The reaeration constant was recalculated using the O'Connor and Dobbins and the Owens et. al. equations, the results were within a 12% error of the previous model, therefore the information from the previous model was used. The information used in the stream assimilations is stated in the calculations section of this memo. The critical DO for this stretch was not allowed to drop below 5.50 mg/l, based on previous models (for all flows).

Worst case scenarios from stretches #5 and #6 were combined and the stream assimilation capacity for stretch #7 was calculated. From previous models, the critical stream DO was 5.73 mg/l. The critical stream DO for the current model was 5.74 mg/l. Therefore, the effluent limitations assumed for the STPs were appropriate.

A worst case for the Po River and the Ni River were determined and using that information, acceptable effluent limitations were able to be determined. The following tables present the proposed effluent limitations for the Thornburg and Wishner STPs:

Thornburg STP

Flow MGD	BOD_5 mg/l	DO mg/l
0.175	24	6.8
0.275	20	6.8
0.345	20	7.0

Wishner STP

Flow MGD	BOD_5 mg/l	DO mg/l
0.150	24	6.5
0.175	24	6.8
0.200	20	6.8
0.225	20	6.8
0.250	20	6.8

Calculations:

Streteh #1

J.J. Wright STP
$Q = 0.015$ MGD
$BOD_5 = 24$ mg/l
$DO = 6.0$ mg/l

x-tributary
$Q = 0$

$BOD_u = 24(2.5) = 60$ mg/l

$DO_s = 7.6(1 - 0.00003[220]) = 7.55$ mg/l

$DO_f = 6.0$

$D_a = 7.55 - 6.0 = 1.55$ mg/l

$k_r = 0.2\,d^{-1}$ @ 30° $k_r = 0.2(1.047)^{10} = 0.317\,d^{-1}$

$k_a = 10.9\left(\frac{u}{H}\right)^{0.85}$ Negulescu & Rojanski for depths < 0.5 ft

$k_a = 10.9\left(\frac{0.3}{0.4}\right)^{0.85} = 8.54\,d^{-1}$

k_a @ 30°C $= 8.54(1.024)^{10} = 10.83\,d^{-1}$

$t = \frac{1.0\text{ mi}}{0.35\text{ fps}} \left| \frac{5280\text{ ft/mi}}{86{,}400\text{ s/d}} \right. = 0.2\text{ d}$

Streteh #2

End of #1
$BOD_5 = 22.53$ mg/l
$DO = 5.88$ mg/l
$Q = 0.015$ MGD

Po River
$BOD_5 = 3.0$ mg/l
$DO = 6.5$ mg/l
$Q = 0.137$ MGD

$$BOD_u = \left[\frac{22.53(0.015) + 3(0.137)}{0.152}\right] 2.5 = 12.3 \text{ mg/l}$$

$$DO_s = 7.6(1 - 0.00003[190]) = 7.56 \text{ mg/l}$$

$$DO_f = \frac{5.88(0.015) + 6.5(0.137)}{0.152} = 6.44 \text{ mg/l}$$

$$D_a = 7.56 - 6.44 = 1.12 \text{ mg/l}$$

$k_r = 0.12$ $\quad k_r @ 30^\circ = 0.12(1.047)^{10} = 0.19$

$$k_a = \frac{23.3\, u^{0.73}}{H^{1.75}}$$ Owens et al.

$0.1 \le u \le 1.8$ fps

$0.4 \le H \le 11$ ft

$$k_a = \frac{23.3(0.1)^{0.73}}{(1.2)^{1.75}}$$

$k_a = 3.16 \text{ d}^{-1}$

$k_a @ 30^\circ = 3.16(1.024)^{10} = 4.09 \text{ d}^{-1}$

$$t = \frac{2.6 \text{ mi}}{0.1 \text{ fps}} \left| \frac{5280}{86,400} \right. = 1.6 \text{ d}^{-1}$$

Stretch #3

End of Stretch #2	Po River	Indian A
BOD = 3.63 mg/l	BOD = 3.0 mg/l	BOD = 21
DO = 7.12 mg/l	DO = 6.5 mg/l	DO = 6.5
Q = 0.152 MGD	Q = 0.008 MGD	Q = 0.2 M

$$BOD_u = \left[\frac{3.63(0.152) + 3(0.008) + 0.2(21)}{0.36}\right] 2.5 = 37.3$$

$DO_s = 7.6(1 - 0.00003[170]) = 7.56 mg/L$

$DO_f = \frac{7.12(0.152) + 6.5(0.008) + 6.5(0.2)}{0.36} = 6.76 mg/L$

$D_a = 7.56 - 6.76 = 0.8 mg/L$

$k_r = 0.169$ $\quad k_r @ 30° = 0.169(1.047)^{10}$

$k_r = 0.268 d^{-1}$

$k_a = 4.09$ (see above)

$t = \frac{2.45 mi}{0.1 fps} \left| \frac{5280 ft/1 mi}{86400 s/d} \right. = 1.5 d$

Stretch #4 (x-tributary / Thornburg STP)

Thornburg STP

	Q	BOD_5	D.O
1.	0.175 MGD	24 mg/L	6.8 mg/L
2.	0.275 MGD	20 mg/L	6.8 mg/L
3.	0.345 MGD	20 mg/L	7.0 mg/L

x-tributary

$Q = 0$

$DO_s = 7.6(1 - 0.00003[220]) = 7.55 mg/L$

$k_a = 10.9\left(\frac{u}{H}\right)^{0.85}$ (see above)

$ka = 10.9\left(\frac{0.4}{0.4}\right)^{0.85} = 10.9$

$ka @ 30° = 10.9(1.024)^{10} = 13.8 d^{-1}$

Q = 0.175	Q = 0.275	Q = 0.345 ④
1. BOD_u = 24(2.5) 60 mg/l	20(2.5) 50 mg/l	20(2.5) 50 mg/l
2. D_a = 0.75 mg/l	0.75 mg/l	0.55 mg/l

Stretch #5

End of Stretch #4

① Q = 0.175 MGD
BOD = 22.17 mg/l
DO = 6.27 mg/l

② Q = 0.275 MGD
BOD = 18.7 mg/l
DO = 6.63 mg/l

③ Q = 0.345
BOD = 18.7 mg/l
DO = 6.64 mg/l

End of Stretch #3

Q = 0.36 MGD
BOD = 10.0 mg/l
DO = 5.81 mg/l

Po River

Q = 0.005 MGD
BOD = 3 mg/l
DO = 6.5 mg/l

① $BOD_u = \left(\frac{22.17(0.175) + 10(0.36) + 3(0.005)}{0.54}\right)2.5 = 34$

$$DO_f = \frac{6.27(0.175) + 5.81(0.36) + 6.5(0.005)}{0.54} = 5.97$$

$$DO_s = 7.6(1 - 0.00003[140]) = 7.54 \text{ mg/l}$$

$$D_a = 7.54 - 5.97 = 1.6 \text{ mg/l}$$

$k_r = 0.16$ $\quad k_1 @ 21^\circ = 0.16(1.047)^{10} = 0.26/d$

k_a - see above

(2) $BOD_u = \left(\frac{18.7(0.275) + 10(0.36) + 3(0.005)}{0.64}\right) 2.5 = 34.2$ mg/l (5)

$DO_f = \frac{6.63(0.275) + 5.81(0.36) + 6.5(0.005)}{0.64} = 6.17$ mg/l

$D_a = 7.57 - 6.17 = 1.4$ mg/l

(3) $BOD_u = \left(\frac{18.7(0.345) + 10(0.36) + 3(0.005)}{0.71}\right) 2.5 = 35.4$ mg/l

$D_f = \frac{6.64(0.345) + 5.81(0.36) + 6.5(0.005)}{0.71} = 6.22$ mg/l

$D_a = 7.57 - 6.22 = 1.35$ mg/l

$k_r = 0.265$ (@ 30°C.)

Stretch # 6 (Ni River / Wishner)

Wishner STP

	Q(MGD)	BOD(mg/l)	DO(mg/l.)
1.	0.150	21	6.5
2.	0.175	21	6.8
3.	0.20	20	6.8
4.	0.225	20	6.8
5.	0.250	20	6.8

Ni River

Q = 0.149 MGD
BOD = 3.0 mg/l
DO = 6.5 mg/l
v = 0.3 fps
H = 2 ft
k_a = 3.9 d^{-1}

} old model

$DO_s = 7.6(1 - 0.00003[190]) = 7.56$ mg/l

BOD_u - Calculated as mass balances (see above)
D_a - mass balance subtracted from DOsat.
K_a - used old model; did comparison calculations and obtained similar results using O'Conner & Dobbins and Owens et al equations (error factor ~12%

Chart below - information used in Monroe Calculator for each flow

	0.15 MGD	0.175 MGD	0.2 MGD	0.225 MGD	0.25 M
1. BOD_u	33.9 mg/l	35.9 mg/l	31.7 mg/l	33.1 mg/l	34.2 m
2. TKN	0	0	0	0	0
3. D_a	1.06 mg/l	0.9 mg/l	0.85 mg/l	0.88 mg/l	0.87 m
4. K_r	0.255 d^{-1}	0.263 d^{-1}	0.245 d^{-1}	0.249 d^{-1}	0.255
5. K_N	0	0	0	0	0
6. K_d	3.9 d^{-1}	3.9 d^{-1}	3.9 d^{-1}	3.9 d^{-1}	3.9 d
7. t	0.5 d	0.5 d	0.5 d	0.5 d	0.5 d
8. DO_s	7.56 mg/l	7.56 mg/l	7.56 mg/l	7.56 mg/l	7.56 m

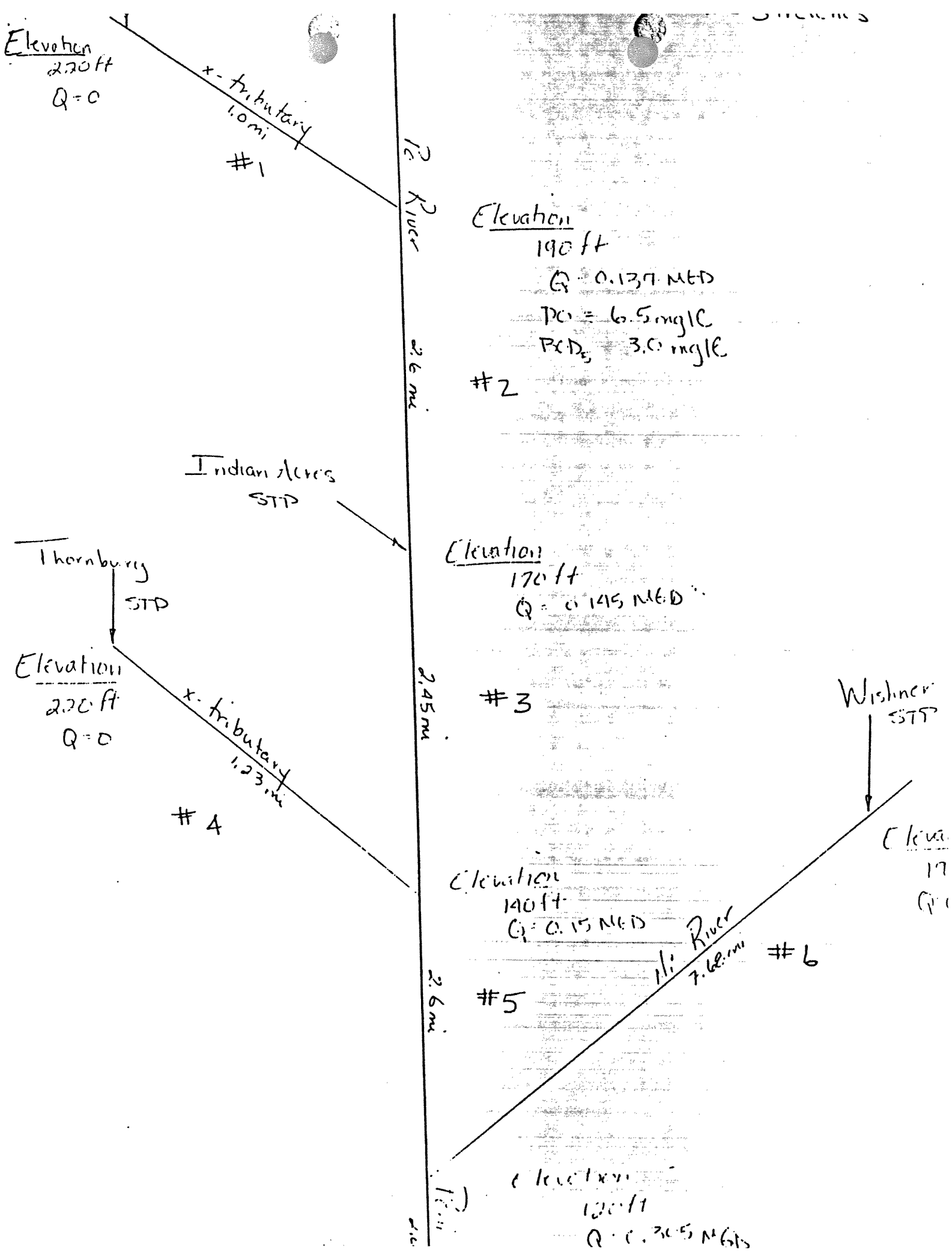
The worst cases from stretch #5 and stretch #6 were modeled down stretch #7 (Pon. River) 3 miles. The DO critical was 5.74 mg/L, previous models allowed degradation to 5.73 mg/L, therefore the following limits were established for Thornburg and Wishner STP's:

Thornburg STP

Flow MGD	BOD_5 mg/L	D.O mg/L
0.175	24	6.6
0.275	20	6.8
0.345	20	7.0

Wishner STP

Flow MGD	BOD_5 mg/L	DO mg/L
0.150	24	6.5
0.175	24	6.6
0.200	20	6.8
0.225	20	6.6
0.250	20	6.6


Elevation
220 ft
Q = 0
x - tributary
1.0 mi
#1
Pe Ell River
Elevation
190 ft
Q = 0.137 MGD
DO = 6.5 mg/L
BOD5 = 3.0 mg/L
#2
2.6 mi
Indian Acres
STP
Thornbury
STP
Elevation
170 ft
Q = 0.145 MGD
#3
2.45 mi
Elevation
220 ft
Q = 0
x. tributary
1.23 mi
#4
Wishner
STP
Elevation
140 ft
Q = 0.15 MGD
#5
Willapa River
7.6 mi
#6
2.6 mi
Elevation
120 ft
Q = 0.305 MGD

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Spotsylvania County, Virginia.

PUBLIC COMMENT PERIOD: December 22, 2009 to 5:00 p.m. on January 20, 2009

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Spotsylvania County
600 Hudgins Road, Fredericksburg, VA 22408
VA0029513

NAME AND ADDRESS OF FACILITY: Thornburg Wastewater Treatment Plant
5225 Mud Tavern Road, Woodford, VA 22513

PROJECT DESCRIPTION: Spotsylvania County has applied for reissuance of a permit for the public Thornburg Wastewater Treatment Plant. The applicant proposes to release sewage wastewaters from residential areas at a rate of 0.345 million gallons per day into a water body. The sludge will be transferred to the FMC Wastewater Treatment Plant (VA0068110) for further treatment and will be disposed of in a landfill with the sludge from the FMC WWTP The facility proposes to release the sewage wastewaters into an unnamed tributary of the Po River in Spotsylvania County in the York River Watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, BOD_5, total suspended solids, ammonia as nitrogen, dissolved oxygen, and total hardness.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. DEQ may hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the documents at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
Name: Anna T. Westernik
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3837 E-mail: anna.westernik@deq.virginia.gov Fax: (703) 583-3821

Attachment 11

Revised 2/2003

State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Thornburg WWTF
NPDES Permit Number:	VA00029513
Permit Writer Name:	Anna Westernik
Date:	October 27, 2009

Major [ ] **Minor** [X] **Industrial** [ ] **Municipal** [x]

I.A. Draft Permit Package Submittal Includes:	**Yes**	**No**	**N/A**
1. Permit Application?	x		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	x		
3. Copy of Public Notice?	x		
4. Complete Fact Sheet?	x		
5. A Priority Pollutant Screening to determine parameters of concern?	x		
6. A Reasonable Potential analysis showing calculated WQBELs?	x		
7. Dissolved Oxygen calculations?	x		
8. Whole Effluent Toxicity Test summary and analysis?		x	
9. Permit Rating Sheet for new or modified industrial facilities?		x	

I.B. Permit/Facility Characteristics	**Yes**	**No**	**N/A**
1. Is this a new, or currently unpermitted facility?		x	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	x		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	x		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		x	
5. Has there been any change in streamflow characteristics since the last permit was developed?		x	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		x	
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	x		
8. Does the facility discharge to a 303(d) listed water?	x		
a. Has a TMDL been developed and approved by EPA for the impaired water?		x	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?		x	
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	x		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		x	
10. Does the permit authorize discharges of storm water?		x	

Attachment 12

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs*

(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	**Yes**	**No**	**N/A**
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	x		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	x		

II.B. Effluent Limits – General Elements	**Yes**	**No**	**N/A**
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	x		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	x		

II.C. Technology-Based Effluent Limits (POTWs)	**Yes**	**No**	**N/A**
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	x		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	x		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			x
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	x		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	x		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		x	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			x

II.D. Water Quality-Based Effluent Limits	**Yes**	**No**	**N/A**
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	x		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?		x	
3. Does the fact sheet provide effluent characteristics for each outfall?	x		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	x		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	x		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	x		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	x		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?		x	
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	x		

* Facility is a PVOTW and a municipal.

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Review Checklist – For Non-Municipals

(To be completed and included in the record for all non-POTWs)

II.A. Permit Cover Page/Administration	**Yes**	**No**	**N/A**
1. Does the fact sheet **or** permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?			
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?			

II.B. Effluent Limits – General Elements	**Yes**	**No**	**N/A**
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?			
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?			

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ)	**Yes**	**No**	**N/A**
1. Is the facility subject to a national effluent limitations guideline (ELG)?			
a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?			
b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?			
2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?			
3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?			
4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a "reasonable measure of ACTUAL production" for the facility (not design)?			
5. Does the permit contain "tiered" limits that reflect projected increases in production or flow?			
a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?			
6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?			
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits?			
8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?			

II.D. Water Quality-Based Effluent Limits	**Yes**	**No**	**N/A**
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?			
2. Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL?			
3. Does the fact sheet provide effluent characteristics for each outfall?			
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?			
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?			
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?			

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Anna Westernik
Title	Environmental Specialist II
Signature	A Westernik
Date	October 27, 2009